Appendix B
Measurement Methodology for Determining Quantities of NPEP Priority Chemicals– GPRA and Trends Analyses

This appendix discusses the methodology[1] used to extract the applicable data from the TRI database to calculate NPEP Priority Chemical quantities. We also discuss the approaches used to look at both progress toward the Government Performance and Results Act (GPRA) goals and trends for the NPEP Priority Chemicals in the NPEP Trends Report and limitations of the methodology. In previous trends reports, one methodology has been used to examine the GPRA goal and trends in NPEP Priority Chemical quantities. For this report, two approaches have been established from the original methodology. The first approach pertains to the analysis of progress toward EPA's GPRA 50 percent reduction goal and is referred to in this report as the "GPRA-Analysis." The GPRA-Analysis approach, for the most part, parallels the original methodology, but also now includes some refinements. The second approach is a modification to the first and is used to analyze trends in quantities of NPEP Priority Chemicals reported over time. It is referred to in this report as the "Trends-Analysis." The Trends-Analysis approach utilizes the original approach as a base line; however, it has been modified to address previously disregarded segments of the TRI reporting universe in order to better identify opportunities in reducing NPEP Priority Chemicals.

B.1 Guidelines for Developing the Measurement Methodology

In addition to the overarching goal of developing an approach that could be used to track changes in the quantities of specific chemicals potentially found in hazardous waste over time, the development of the measurement methodology was originally guided by a number of measurement requirements and important constraints. A primary consideration for EPA was to develop a measurement methodology useful for tracking progress toward the GPRA goal. Consequently, the methodology had to be amenable to national application for a specified set of chemicals. It also needed to provide a high-level of detail, such as the ability to show trends by chemical, industry sector, and geographic region.

It was important for the measurement methodology to be concise and easy to understand. This meant that a simpler, more intuitive approach was preferred over a sophisticated approach that might provide some improvements in analytical quality, but sacrifice transparency and ease of application. It also was considered important that the method not be expensive to implement and time consuming to apply to trends analysis. This measurement methodology was initially developed to provide information relating to EPA's goal of a 50 percent reduction of NPEP Priority Chemicals in hazardous wastes at a national level. However, EPA also wanted the methodology to have sufficient flexibility so that it could be used for non-GPRA chemicals and provide the EPA Regions and the States with a tool to independently use to identify potential targets for the National Partnership for Environmental Priorities and track progress toward meeting NPEP Priority Chemicals reduction goals.

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[1] Please note the NPEP Priority Chemical methodology used in developing this Trends Report differs from the methodology used by the TRI program to show trends for the EPCRA section 313 chemicals in the annual TRI Public Data Release. See Appendix B for a detailed description of the NPEP Priority Chemical methodology used in this Trends Report.

B.2 Data Source for the Measurement Methodology

In developing the original measurement methodology, EPA considered a variety of available environmental data sources, including the Biennial Reporting System (BRS), the Toxics Release Inventory (TRI), and the National Hazardous Waste Constituent Survey (NHWCS). After evaluating the pros and cons of using each of these data sources, EPA determined that the best source of information for the measurement methodology would be the TRI.

The TRI is a publicly available EPA database that contains information on more than 650 toxic chemicals that are being used, manufactured, treated, transported, or released into the environment. Information in the TRI is reported on a chemical-specific basis, rather than by hazardous waste stream. This information is reported annually and reviewed and updated, on an on-going basis, to reflect corrections to reported data.[2] Thus, the TRI data meet the need for the measurement methodology to track chemical quantities over time.

TRI was selected because it:

- Provides information on releases to all environmental media;
- Can be used to track chemical-specific quantities over time;
- Contains annual data that are reviewed and updated to reflect corrections to reported data; and
- Covers a large percentage of the industry sectors that generate hazardous waste.

The TRI covers a wide variety of industry sectors, including those in manufacturing (i.e., Standard Industrial Classification (SIC) codes 20 through 39). These industry sectors account for more than 90 percent of the hazardous waste generated in the U.S.[3,4] Although the TRI collects information on the quantities of chemicals found in waste, it does not necessarily provide the means by which to differentiate the extent to which the chemicals may be contained in hazardous versus non-hazardous waste. Thus, EPA selects TRI data elements to construct chemical quantities in hazardous waste, called NPEP Priority Chemical (NPEP PC) quantities, for reporting progress on the GPRA goal.

The TRI was established in 1986 by Title III of the Superfund Amendments and Reauthorization Act (SARA), also referred to as Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA). EPCRA was passed to promote planning for chemical emergencies and to provide information to the public about the presence and release of toxic and hazardous chemicals in their communities. Following passage of the Pollution Prevention Act of 1990, the TRI was expanded to include reporting of additional waste management and pollution prevention activities. Beginning in 1991, covered facilities were required to report quantities of TRI chemicals recycled, combusted for energy recovery, and treated on and off site. These waste management data have strengthened the TRI as a tool for providing information on facilities'

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[2] Data for each year are published approximately 15 to 18 months following the end of the reporting year. For example, data for reporting year 2001 were published in June 30, 2003.

[3] Studies conducted in the early 1990's to determine whether TRI quantities were representative of RCRA waste concluded that the TRI covers a large portion of the hazardous waste generated in the U.S. For additional information on these studies and their findings, refer to Bhatnagar, S., and B.C. Murray; Efforts to Link the Biennial Reporting System (BRS) and the Toxics Release Inventory (TRI) (prepared for EPA's Office of Solid Waste); 1997.

[4] A study conducted in 1995 found that more than 93 percent of hazardous waste was generated at facilities also covered under the TRI. For additional information on this study, refer to INFORM, Inc.; *Toxics Watch 1995*; 1995.

handling of TRI chemicals and for analyzing progress in reducing releases. Facilities must report to the TRI if they meet the following three criteria:

i. Have 10 or more full-time employees (20,000 hours equivalent);
ii. Either manufacture or process more than 25,000 pounds per year—or otherwise use more than 10,000 pounds per year—of any chemical which is not listed as a PBT chemical, during the calendar year (the reporting threshold); and
iii. Fall within specific SIC codes.

Reporting facilities must submit a TRI Form R each year for the chemicals used, processed, or manufactured in excess of the reporting threshold. In this form, facilities report to the TRI the quantities of listed chemicals released on site to air, water, and land and injected underground (Section 5 of Form R) and the quantities of chemicals transferred off site for recycling, energy recovery, treatment, and disposal (Section 6 of Form R). They also report production-related waste management information on quantities recycled, combusted for energy recovery, treated, or released (including disposed of), both on and off site, and catastrophic or other one-time releases (Section 8 of Form R).

For both the GPRA-Analysis and Trend-Analysis, the methodology used in this trends report has been updated to account for variations in the data set over time.

Facilities in the manufacturing sector (SIC codes 20 through 39) have been required to report to the TRI since its inception. Beginning with reporting year 1994, Federal facilities have also been required to report to the TRI. A further expansion of the TRI reporting sectors occurred in 1998 when the following seven sectors were added:

a. Metal Mining (SIC code 10, except 1011, 1081, and 1094);
b. Coal Mining (SIC code 12, except 1241);
c. Electrical Utilities that Combust Coal (SIC codes 4911, 4931, and 4939);
d. RCRA Subtitle C Hazardous Waste Treatment and Disposal Facilities (SIC code 4953);
e. Chemical Wholesalers (SIC code 5169);
f. Petroleum Terminals and Bulk Stations (SIC code 5171); and
g. Solvent Recovery Services (SIC code 7389).

Data for these new industry sectors has not been included in the GPRA-Analysis approach. Including these new industry sectors would have introduced another baseline year that would have complicated the trends analyses to track progress toward the GPRA goal. EPA will continue to measure progress made toward the current GPRA goal, evaluating only those 17 NPEP Priority Chemicals for which there is TRI data since 1991 in order to most accurately track progress toward the goal. It should be noted however, that for the Trends-Analysis, EPA has incorporated these new industry sectors in this update of the NPEP Priority Chemical Trends Report (Section B.4.1).

In 1995, three additional NPEP Priority Chemicals were added to the list of chemicals and toxic chemical categories reported to the TRI. For the 2000 reporting year, the reporting criteria were changed for certain Persistent, Bioaccumulative, and Toxic (PBT) chemicals.[5, 6, 7] TRI was expanded to include new PBT chemicals and reporting thresholds were lowered for both the newly-added PBT chemicals and certain PBT chemicals already on the TRI list. In a rule (64 FR 58666) finalized on October 29, 1999, EPA added six PBT chemicals and one PBT chemical category. PBT chemicals persist and bioaccumulate in the environment and they have the potential to pose greater exposure to humans and the environment over a longer period of time, making even small quantities of these chemicals of concern. Therefore, EPA established thresholds lower than the standard TRI reporting thresholds of 25,000 pounds and 10,000 pounds. For those chemicals that are persistent and bioaccumulate, a threshold of 100 pounds manufactured, processed or otherwise used was established. For the subset of PBT chemicals that are *highly* persistent and *highly* bioaccumulative, a threshold of 10 pounds was established. In addition, because dioxins are highly persistent and highly bioaccumulative, but are generally produced in extremely small quantities, they threshold for dioxin and dioxin-like compounds was set at 0.1 grams. In addition, on January 17, 2001, EPA issued a final rule that lowered the EPCRA Section 313 reporting thresholds for lead/lead compounds to 100 pounds.[8] The GPRA-Analysis has been modified to account for the fact that the threshold levels have changed on 6 of the 17 chemicals for which facilities have been reporting information to TRI since 1991, including heptachlor, hexachlorobenzene, mercury/mercury compounds, methoxychlor, trifluralin, and lead/lead compounds (see Section B.3). In addition, for this update of the Trends Report, a trends analysis is presented for each of the NPEP Priority Chemicals for which there is TRI data (see Section B.4.1). The trends analysis is no longer presented in terms of the "1991 NPEP Priority Chemicals," the "1995 NPEP Priority Chemicals," and the "2000 NPEP Priority Chemicals."

B.3 Description of the Measurement Methodology for GPRA-Analysis

The **GPRA-Analysis** measurement methodology consists of calculating NPEP Priority Chemical quantities from 1991 to 2001. This measurement methodology uses TRI data to measure progress toward EPA's GPRA 50 percent reduction goal. Because not all data in the TRI are needed to calculate NPEP Priority Chemical quantities, EPA developed an approach to identify and extract the necessary data to do so. This approach consists of the steps discussed below.

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[5] See U.S. National Archives and Records Administration; 64 *Federal Register* 58666; October 29, 1999.

[6] The de minimis exemption and Form A cannot be used starting in 2000 for the PBT TRI chemicals (those with lower thresholds). This means that facilities are required to include all amounts in threshold determinations and release and other waste management calculations for these chemicals.

[7] In TRI, these chemicals are referred to as PBT chemicals. For the purposes of this Report, these chemicals are simply included as part of the group of chemicals referred to as NPEP Priority Chemicals.

[8] See U.S. Environmental Protection Agency, Office of Environmental Information; *TRI Lead Fact Sheet* (E A260-F-01-003); 2001. Available electronically at: ttp://www.epa.gov/tri/lawsandregs/tri_pb_rule.htm.

Step 1: Extract Data Regarding NPEP Priority Chemicals Reported to TRI

The Chemical Abstract System (CAS) numbers of those 17 chemicals[9] identified by EPA as NPEP Priority Chemicals for which TRI data was available since 1991, were extracted from the TRI database for reporting years 1991 through 2001.[10] Only those reports submitted on TRI Form R were included; Form A data was excluded. The extracted data were used to create a NPEP Priority Chemical database. It should be noted that for data elements where the facility reported more than one, such as SIC code, the primary entry was used. Exhibit B-1 lists the NPEP Priority Chemicals examined in this report under the GPRA-Analysis.

Exhibit B-1. NPEP Priority Chemicals

NPEP Priority Chemical Names and CAS Numbers	
NPEP PRIORITY CHEMICALS REPORTED TO TRI SINCE 1991	
Anthracene (120-12-7)	Mercury (7439-97-6) and Mercury Compounds (N458)
Cadmium and (7440-43-9) Cadmium Compounds (N078)	Methoxychlor (72-43-5)
Dibenzofuran (132-64-9)	Naphthalene (91-20-3)
Heptachlor (76-44-8)	Pentachlorophenol (87-86-5)
Hexachloro-1, 3-butadiene (87-68-3)	Quintozene (82-68-8)
Hexachlorobenzene (118-74-1)	1,2,4-Trichlorobenzene (120-82-1)
Hexachloroethane (67-72-1)	2,4,5-Trichlorophenol (95-95-4)
Lead (7439-92-1) and Lead Compounds (N420)	Trifluralin (1582-09-8)
Lindane (58-89-9)	

Step 2: Identify Relevant Facilities

To be included in the analysis, a facility needs to meet two criteria: 1) The facility must have an EPA identification (ID) number (also referred to as RCRA ID); and 2) the facility must be in one of the "original" reporting industries (i.e., industries that reported to the TRI between 1991 and 1998, the year in which the list of reporting sectors was expanded). Data for facilities that do not meet the above criteria were removed from the Priority Chemical database.

Facilities with an EPA Identification Number

Not all facilities that report to TRI are generators of hazardous wastes. However, facilities that generate hazardous wastes must obtain a RCRA ID number. Therefore, we assumed that facilities with an RCRA ID are likely to generate NPEP Priority Chemicals potentially associated

[9] For the purposes of this report, EPA combined each of the three metals (cadmium, lead, and mercury) with its associated compounds and analyzed each of them as a single entity. For example, Lead (CAS No. 7439921) and Lead compounds (CAS No. N420) are addressed simply as Lead/lead compounds.

[10] In developing this report, 1991 to 2001 TRI data frozen as of March 3, 2003 were used. This is the same data set used for the 2001 TRI Public Data Release (June 30, 2003). However, these data were revised based on quality assurance (QA) activities.

with hazardous wastes, and, thus, the analysis would be limited to those facilities. A valid RCRA ID is comprised of 12 characters, the first 3 being alpha characters and the remaining 9 being numeric. In addition, the first two alpha characters represent a state or territory abbreviation. In an effort to ensure that facilities with valid RCRA IDs were included in the NPEP Priority Chemical database, a quality assurance step was conducted. Research was conducted for all facilities that had an entry in their RCRA ID field of the Form R that was not a valid RCRA ID, such as only containing 11 characters or beginning with two alpha characters that did not represent a state or territory. This research consisted of a review of information from RCRA Info and Regional on-line databases to identify the valid RCRA ID for those parties for which one was available. If a valid RCRA ID was identified the Priority Chemical database was updated. If no valid RCRA ID could be identified then the incorrect entry was deleted.

Facilities in "Original" Reporting Industries

As stated earlier, the primary initial objective of the GPRA-Analysis measurement methodology was to measure progress made toward the GPRA goal of a 50 percent reduction of NPEP Priority Chemicals in hazardous waste by the year 2005, compared to the quantities generated in 1991. In order to measure this progress, it is necessary to ensure that only industry sectors that reported to the TRI in 1991 are included in the analysis. For this reason, NPEP Priority Chemical quantities are based on original facilities, as categorized by the TRI Program. The TRI categorizes facilities as original or new based on the following logic.

For reporting years 1991 through 1997, all facilities are categorized as original.[11] However, beginning with reporting year 1998 (i.e., the year in which seven new SIC sectors were required to begin reporting to the TRI), facilities were categorized as original or new as follows:

SIC codes added to TRI in 1998

1021	1221	4911	4953	5169	5171	7389
1031	1222	4931				
1041	1231	4939				
1044						
1061						
1099						

Original facilities:

- Facilities that did not report any new SIC codes; and
- Facilities that reported both original and new SIC codes and reported to the TRI any reporting year between 1991 and 1997.

New facilities:

- Facilities that only reported new SIC codes; and
- Facilities that reported both original and new SIC codes and did not report to the TRI between 1991 and 1997.

Note that the above categorization was applied to each reporting year, beginning with 1998. In addition, *all* SIC codes reported by the facilities were considered in the categorization process.

[11] Note that, although only facilities with SIC codes 20 through 39 were required to report to the TRI between 1991 and 1997, a small number of facilities with SIC codes other than SIC codes 20 through 39 reported to the TRI. Data for all of these facilities are included in the analysis.

Step 3: Identify Relevant Releases and Waste Management Reports

TRI collects information on chemicals in wastes that are reported as releases or as various methods of waste management.[12] However, not all of these reports are associated with hazardous waste. Therefore, it is necessary to determine which reports are most likely relevant to the measurement of NPEP Priority Chemical quantities in hazardous waste. In order to be included in the NPEP Priority Chemical quantities, two criteria needed to be met: 1) the quantity needs to be associated with hazardous waste. For example, NPEP Priority Chemical quantities dealing with air and water releases, as further discussed below, are not necessarily associated with hazardous waste, while releases to land are considered relevant and 2) the quantity needs to be amenable to NPEP Priority Chemical reduction. This includes those quantities of NPEP Priority Chemicals generated from routine production practices rather than those generated as a result of a cleanup from past contamination. Quantities of NPEP Priority Chemicals amenable to reduction also include wastes from spills because spill prevention is a common and effective NPEP Priority Chemical reduction practice. NPEP Priority Chemicals not amenable to reduction include those related to remedial actions, catastrophic events, or other one-time events. Recycling is considered a valid mechanism for reducing or eliminating waste and, as such, recycled quantities are not included in NPEP Priority Chemical quantities. Exhibit B-2 lists the releases and management methods reported to the TRI and whether they are included in the NPEP Priority Chemical quantities. Data for those releases and management methods not included in the NPEP Priority Chemical quantities were removed from the NPEP Priority Chemical database.

Exhibit B-2. TRI Releases/Management Methods Considered for NPEP Priority Chemical QTY

Section of Form R	Data Element Description	Included in PC Quantity?	Reason for Inclusion or Exclusion
5.1	Fugitive air	No	Not relevant to hazardous waste
5.2	Point-source air	No	Not relevant to hazardous waste
5.3	Surface-water discharge	No	Not relevant to hazardous waste
5.4.1	Underground injection onsite to Class I wells	Yes	Relevant to hazardous waste
5.4.2	Underground injection onsite to Class II-V wells	No	Not relevant to hazardous waste
5.5.1A	Disposal in RCRA Subtitle C landfills	Yes	Relevant to hazardous waste
5.5.1B	Other landfills	No	Not relevant to hazardous waste
5.5.2	Onsite land treatment	Yes	Relevant to hazardous waste
5.5.3	Onsite surface impoundment	Yes	Relevant to hazardous waste
5.5.4	Other onsite disposal	Yes	Relevant to hazardous waste
6.2	Transfers to Other Off-Site Locations	Yes, with the exception of those amounts listed as offsite disposal at landfills, surface impoundments, and Class I wells (M71 and M72) that did not have a RCRA ID listed for the off-site facility	Relevant to hazardous waste, with the exception of M71 and M72 quantities that were sent to off-site landfills, surface impoundments, and Class I wells without RCRA-IDs, i.e., non-hazardous waste
8.1	Total releases*	Yes	Amenable to PC reduction
8.2	Onsite energy recovery	Yes	Amenable to PC reduction
8.3	Offsite energy recovery	Yes	Amenable to PC reduction
8.4	Onsite recycle	No	Valid PC reduction method
8.5	Offsite recycle	No	Valid PC reduction method
8.6	Onsite treatment	Yes	Amenable to PC reduction
8.7	Offsite treatment	Yes	Amenable to PC reduction
8.8	Remedial actions, catastrophic events, or one-time events	No	Not amenable to PC reduction

[12] It is important to note that the data reported to the TRI are data on specific chemicals in the waste, not on the total quantity of waste. Thus, when the word "waste" is used in the context of TRI data, it only refers to chemicals in the waste.

*Total releases, as defined by TRI on Form R include onsite releases (Section 5 of Form R) and offsite releases (Section 6 of Form R). The section 6 quantities include metal/metal compounds reported in section 6.1 as discharges to POTWs quantities and metal/metal compounds reported in section 6.2 as sent 1) offsite for stabilization/ solidification or 2) to wastewater treatment (excluding POTWs). Quantities reported in sections 5 and 6 due to remedial actions, catastrophic events, or non-production related events are excluded. So, section 8.1 = section 5 + section 6.1 (metals/metal compounds only) + section 6.2 (disposal) - section 8.8 (releases to catastrophic events, remedial actions, etc).

Step 4: Calculate NPEP Priority Chemical Quantities

Three quantities were then calculated for each record in the NPEP Priority Chemical database: (1) total land disposal quantity, (2) total energy recovery quantity, and (3) total treatment quantity. Each record in the database contains the following information: facility identification information (i.e., facility name, TRI ID); CAS number and chemical name of the NPEP Priority Chemical; quantities for each of the relevant releases/waste management activities; and reporting year. Exhibit B-3, below shows how the TRI releases and management methods were used to calculate the NPEP Priority Chemical quantities.

As shown, land disposal quantities were calculated by subtracting fugitive air (Section 5.1), point source air (Section 5.2), surface water discharge (Section 5.3), underground injection onsite to Class II-V wells (Section 5.4.2), other landfill (Section 5.5.1B), and off-site disposal of non-hazardous wastes at landfills, surface impoundments, and class I wells (6.2 entries without RCRA IDs) quantities from total releases (Section 8.1). Note that, when the total air and water releases in Sections 5.1, 5.2, and 5.3 are greater than total releases in Section 8.1 due to reporting errors or rounding, negative quantities could result. Negative quantities could also result from the fact that Sections 5.1, 5.2 and 5.3 include remedial actions and Section 8.1 does not. In those instances where negative values result, the land disposal quantity were assumed to be equal to zero. Energy recovery quantities were calculated by summing the onsite energy recovery (Section 8.2) and offsite energy recovery (Section 8.3) quantities. Treatment quantities were calculated by summing the onsite treatment (Section 8.6) and offsite treatment (Section 8.7) quantities.

Accounting for Changes to the TRI Reporting Requirements

As discussed above, over the years reporting requirements have changed to include additional chemicals, additional industry sectors, and reduced reporting thresholds. For the purposes of the GPRA-Analysis the addition of chemicals and industry sectors is not relevant as this analysis is only performed for the original SIC codes and 17 chemicals that have been reported to TRI since 1991. Regarding the threshold changes, in order to continue to measure progress towards the GPRA goal on a consistent basis, a "core" group of facilities was established for each NPEP Priority Chemical that had a threshold change. This core group consists of all facilities that had reported that chemical in a year prior to the threshold change. When compiling data for years after the threshold change, only quantities reported by facilities in the core group for that chemical were included. To address facilities that may be new to TRI reporting regardless of the change of threshold, if a facility reported more than 10,000 pounds of that particular chemical (Sections 8.1 through 8.7 in Form R), we assumed that this facility would have had to report to TRI based on the original threshold. Therefore, for any such facility their NPEP Priority Chemical quantities are retained in the GPRA-Analysis.

Refining the Methodology to Only Include Quantities Associated with Off-Site Disposal of Hazardous Wastes

In 1996, facilities were required to separately report to TRI quantities released to onsite RCRA Subtitle C landfills and to onsite Underground Injection Class I wells. However, EPA needs to further differentiate between the quantities of NPEP Priority Chemicals being transferred to offsite hazardous waste and non-hazardous waste management facilities. As the GPRA goal pertains to the reduction of NPEP Priority Chemicals in "hazardous" wastes by 50 percent by the year 2005, compared to the quantities generated in 1991, we refined the methodology to account for the fact that not all off-site disposal is of hazardous wastes.

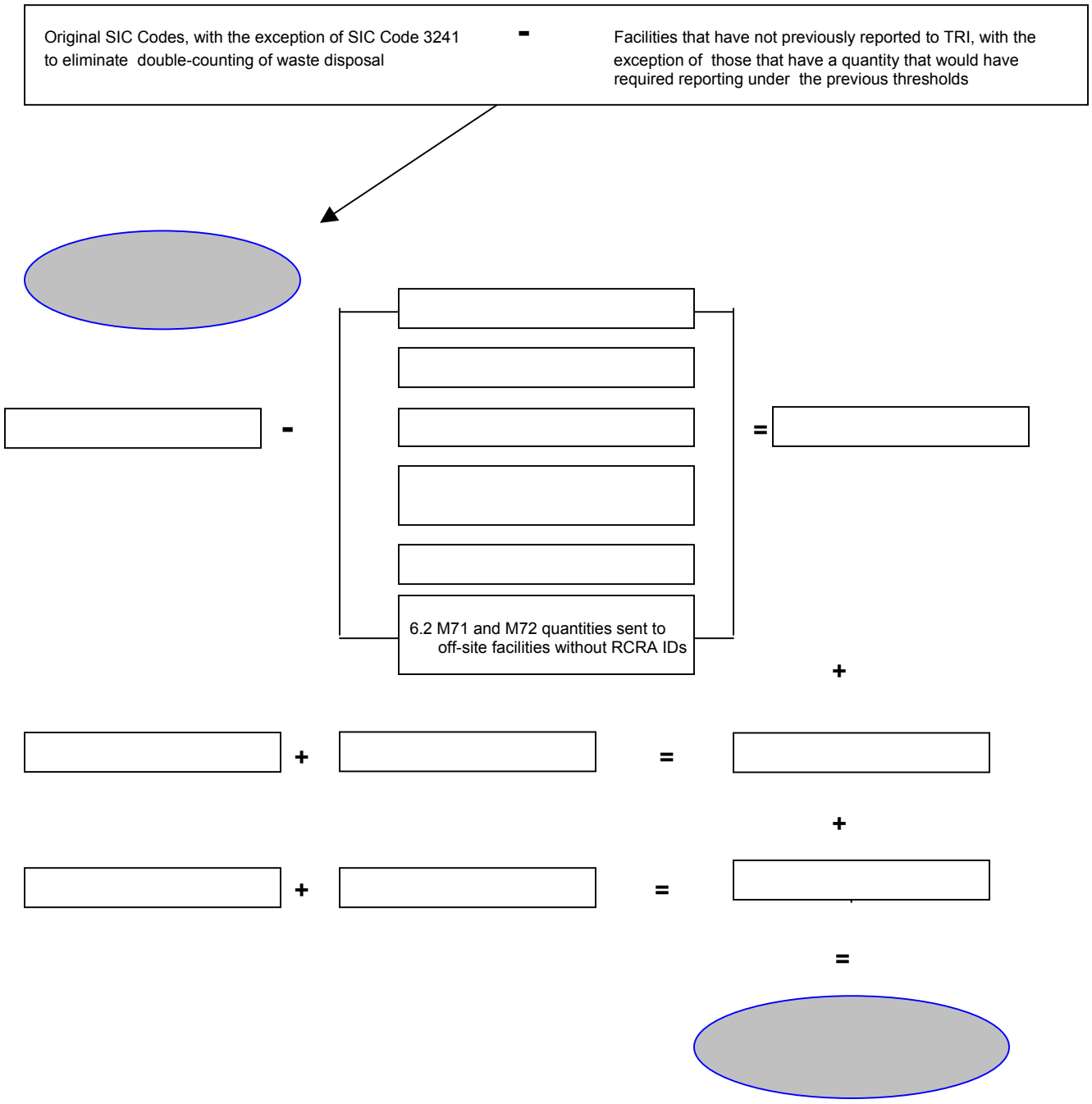
Since 1996, the TRI Form R provides a distinction between onsite disposal in Subtitle C landfills (for hazardous wastes) vs. other onsite landfills and a distinction between onsite placement in Class I (for hazardous wastes) vs. onsite Class II-V underground injection wells. However, for the TRI data available for use in this trends report, the TRI Reporting system does not always provide a clear distinction between Subtitle C hazardous waste and Non-Subtitle C waste. The Reporting Year 2002 Form R distinguishes between offsite disposal at "RCRA Subtitle C Landfills" and "Other Landfills;" however, this is the first year that this distinction was made and to account for this situation, NPEP Priority Chemical quantities sent offsite to landfills, surface impoundments, and Class I wells at facilities that do not have a valid EPA ID number have not been included in the NPEP Priority Chemical total quantity. This approach is consistent with OSWs current methodology, which eliminates facilities that report to TRI, but that do not have an EPA ID number. It is anticipated that this will eliminate wastes that are not Subtitle C RCRA hazardous wastes. This refinement has been applied to all years from 1991 to 2001.

It should be noted that only including quantities from offsite Subtitle C Landfills, surface impoundments, and Class I wells that are noted to have been sent to facilities with EPA IDs will further refine the quantities so that only disposal of chemicals in RCRA hazardous wastes is included. It will not however, completely eliminate the inclusion of quantities in non-RCRA hazardous waste, as the facility may have an EPA ID for a purpose other than the listed disposal activity. For example, a facility could have an EPA ID for its landfill, but report a chemical due to disposal in a surface impoundment that is not used for hazardous waste.

Accounting for Double-Counting

The potential for "double-counting" of wastes to TRI was evaluated. We concluded that for certain SIC codes the quantities of chemicals reported may also have been reported by other parties. For example, chemicals reported by SIC 3241 are associated with liquid waste fuels and solvents that are used by the cement kilns as fuel. They are reported as an offsite transfer and disposed of on-site by incineration. These same quantities would also be reported by the facilities that generated the NPEP Priority Chemicals and sent these NPEP Priority Chemicals to the offsite cement kilns, and would therefore be counted twice, or double-counted. For the GPRA-Analysis, the NPEP Priority Chemical quantities for any facility that receives these quantities and that reports 3241 as its primary SIC code have been removed so that they are not counted twice. This situation also applies to other SIC codes; however, they are "new" SIC codes and are not included in the GPRA-Analysis (see the Trends-Analysis below).

Exhibit B-3. TRI Waste Releases and Management Methods Used to Calculate the NPEP Priority Chemical Quantities



Step 5: Analyze Data and Measure Progress Made Toward the GPRA Goal

Quantifying the Change

Changes in quantities of 17 NPEP Priority Chemicals, reported to TRI since 1991, are used to measure progress made toward the 50 percent reduction goal. While there are many different ways to calculate changes between two years, EPA uses an absolute-quantity-change approach for this report. The absolute-quantity-change approach is used to evaluate the difference in the total quantity reported for a particular chemical between two time periods, e.g., 1991-2001. This approach is simple to understand and use, and quantities are directly connected to potential environmental effects. In addition, it is applicable at the national level, as well as at the industry sector, regional, and State levels.

The absolute-quantity-change approach evaluates the difference in the total quantity reported for a particular chemical between two time periods. This report uses the following formula to calculate a percentage change between two years:

$$M = (W_t - W_b)/W_b \times 100$$

where, for a particular year t:

M = the measure: percentage change between year t and the baseline year;
W_t = the total quantity, or weight in pounds, of the chemical reported in year t; and
W_b = the total quantity, or weight in pounds, of the chemical reported in the baseline year.

For example, the absolute-quantity-change between 1991 and 2001 is calculated for each NPEP Priority Chemical as follows:

$$M = (W_{2001} - W_{1991})/W_{1991} \times 100$$

where:

M = the measure: percentage change between 2001 and 1991;
W_{2001} = the total quantity of the NPEP Priority Chemical reported in 2001; and
W_{1991} = the total quantity of the NPEP Priority Chemical reported in 1991.

B.4 Description of the Measurement Methodologies for this Trends-Analysis and Extraction of Biennial Report (BR) Data

For the purposes of this report, the **Trends-Analysis** measurement methodology consists of calculating NPEP Priority Chemical quantities from 1998 to 2001 for all SIC codes. This measurement methodology uses TRI data to analyze trends in quantities of NPEP Priority Chemicals reported over time. Because not all data in the TRI are needed to calculate NPEP Priority Chemical quantities, EPA developed an approach to identify and extract the necessary data to do so. This approach consists of the steps discussed below. It should be noted that for the NPEP Priority Chemicals that are not reported to TRI, BR data has been used to analyze trends of these chemicals (see Section B.4.2, below)

B.4.1 TRI Data Methodology and Limitations

TRI Data Methodology

Step 1: Extract Data Regarding NPEP Priority Chemicals Reported to TRI

The Chemical Abstract System (CAS) numbers of those 23 chemicals[13] identified by EPA as NPEP Priority Chemicals for which TRI data was available were extracted from the TRI database for reporting years 1998 through 2001.[14] Only those reports submitted on TRI Form R were included; Form A data was excluded. The extracted data were used to create a NPEP Priority Chemical database. Exhibit B-4 lists the NPEP Priority Chemicals examined in this report for the Trends Analysis.

Exhibit B-4. NPEP Priority Chemicals

NPEP Priority Chemical Names and CAS Numbers	
NPEP PRIORITY CHEMICALS REPORTED TO TRI SINCE 1991 (THE 1991 PCs)	
Anthracene (120-12-7)	Mercury (7439-97-6) and Mercury Compounds (N458)
Cadmium and (7440-43-9) Cadmium Compounds (N078)	Methoxychlor (72-43-5)
Dibenzofuran (132-64-9)	Naphthalene (91-20-3)
Heptachlor (76-44-8)	Pentachlorophenol (87-86-5)
Hexachloro-1, 3-butadiene (87-68-3)	Quintozene (82-68-8)
Hexachlorobenzene (118-74-1)	1,2,4-Trichlorobenzene (120-82-1)
Hexachloroethane (67-72-1)	2,4,5-Trichlorophenol (95-95-4)
Lead (7439-92-1) and Lead Compounds (N420)	Trifluralin (1582-09-8)
Lindane (58-89-9)	
NPEP PCs FOR WHICH REPORTING TO TRI BEGAN IN 1995 or 2000	
Benzo(g,h,i)perylene (2000) (191-24-2)	Pendimethalin (1995) (40487-42-1)
Dioxins and Dioxin-like Compounds (2000) (N150)	Pentachlorobenzene (2000) (608-93-5)
TRI polycyclic aromatic compound (PAC) category (1995) (N590)	Phenanthrene (1995) (85-01-8)

Step 2: Identify Relevant Facilities

To be included in the Trends-Analysis, a facility needs to have an EPA identification (ID) number (also referred to as RCRA ID). Data for facilities that do not have a valid RCRA ID were removed from the NPEP Priority Chemical database. It should be noted that in contrast to the GPRA-Analysis, the additional industry sectors that began reporting to TRI in 1998 are likewise included in the Trends-Analysis.

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[13] For the purposes of this report, EPA combined each of the three metals (cadmium, lead, and mercury) with its associated compounds and analyzed each of them as a single entity. For example, Lead (CAS No. 7439921) and Lead compounds (CAS No. N420) are addressed simply as Lead/lead compounds.

[14] In developing this report, 1991 to 2001 TRI data frozen as of March 3, 2003 were used. This is the same data set used for the 2001 TRI Public Data Release (June 30, 2003). However, these data were revised based on OSW quality assurance (QA) activities.

Facilities with an EPA Identification Number

Not all facilities that report to TRI are generators of hazardous wastes. However, facilities that generate hazardous wastes must obtain a RCRA ID number, when reporting to the TRI. Therefore, it was assumed that facilities with an RCRA ID are likely to generate NPEP Priority Chemicals potentially associated with hazardous wastes, and, thus, the Trends-Analysis would be limited to those facilities. The same process was used as described above for the GPRA-Analysis to identify those parties with valid RCRA IDs.

Step 3: Identify Relevant Releases and Waste Management Reports

As described above, TRI collects information on chemicals in wastes that are reported as releases or as various methods of waste management.[15] However, not all of these reports are associated with hazardous waste. Therefore, it is necessary to determine which reports are most likely relevant to the measurement of NPEP Priority Chemical quantities in hazardous waste. The same process used above in the GPRA-Analysis was used for the Trends-Analysis to identify that 1) the quantity is relevant to the RCRA program and 2) the quantity is amenable to NPEP Priority Chemical reduction (see Section B.3, above).

Step 4: Calculate NPEP Priority Chemical Quantities

Three quantities were then calculated for each record in the NPEP Priority Chemical database: (1) total land disposal quantity, (2) total energy recovery quantity, and (3) total treatment quantity. Each record in the database contains the following information: facility identification information (i.e., facility name, TRI ID); CAS number and chemical name of the NPEP Priority Chemical; quantities for each of the relevant releases/waste management activities; and reporting year. Exhibit B-3, in Section B.3, above, shows how the TRI releases and management methods were used to calculate the NPEP Priority Chemical quantities for both the GPRA-Analysis and the Trends-Analysis.

Step 5: Analyze Data Trends

Accounting for Changes to the TRI Reporting Requirements

As discussed above, over the years reporting requirements have changed to include additional chemicals, additional industry sectors, and reduced reporting thresholds. For the purposes of the Trends-Analysis, the addition of chemicals has provided data on 6 additional NPEP Priority Chemicals. In addition, new industry sector data provides additional information regarding potential opportunities in reducing NPEP Priority Chemicals. Therefore, the Trends-Analysis includes data for all SIC codes (including those SIC codes for the industry sectors that began reporting to TRI in 1998) and for all of the 23 NPEP Priority Chemicals that have been reported to TRI. This approach is consistent with the original methodology which does not exclude a SIC

[15] It is important to note that the data reported to the TRI are data on specific chemicals in the waste, not on the total quantity of waste. Thus, when the word "waste" is used in the context of TRI data, it only refers to chemicals in the waste.

code just because it only reports a small quantity of chemical to be used or disposed of in a particular year.

Regarding the threshold changes, as the purpose of the Trends-Analysis is to identify waste opportunities in reducing NPEP Priority Chemicals, information has been included for all "core" and "non-core" facilities in this portion of the methodology. In other words, all facilities that reported any NPEP Priority Chemical quantity are included in this Trends-Analysis. It should be noted that the "core" facilities have been marked in the database system for future reference.

Refining the Methodology to Only Include Quantities Associated with Off-Site Disposal of Hazardous Wastes

As with the GPRA-Analysis, we have refined the methodology to account for the fact that not all off-site disposal is of hazardous wastes. To account for this situation, NPEP Priority Chemical quantities sent offsite to landfills, surface impoundments, and Class I wells at facilities that do not have an EPA ID number are not be included in the NPEP Priority Chemical total quantity. This approach is consistent with the current methodology which eliminates facilities that report to TRI, but that do not have an EPA ID number. It is anticipated that this will eliminate wastes that are not RCRA Subtitle C hazardous wastes. This refinement has been applied to all years from 1998 to 2001.

Accounting for Double-Counting

The potential for "double-counting" of wastes to TRI was evaluated. We concluded that for certain SIC codes the quantities of chemicals reported would also have been reported by other facilities. For example, chemicals reported by facilities in SIC 3241 are associated with liquid waste fuels and solvents that are used by the cement kilns as fuel. They are reported as a transfer and disposed of on-site by incineration. These same quantities would also be reported by the facilities that send the NPEP Priority Chemicals to the cement kilns, and would therefore be counted twice, or double-counted. For the Trends-Analysis, the NPEP Priority Chemical quantities for any facility that receives these NPEP Priority Chemical quantities and that reports 3241 as its primary SIC code have been removed so that they are not counted twice.

In 1998, RCRA Subtitle C hazardous waste treatment and disposal (TSD) facilities (SIC Code 4953) were required to begin reporting to TRI. It is anticipated that double-counting will occur if the facility generating the NPEP Priority Chemicals reports these quantities of NPEP Priority Chemicals as transfers to off-site facilities and TSD facilities report those same quantities of NPEP Priority Chemicals as on-site releases. As such, the NPEP Priority Chemical methodology was revised to remove NPEP Priority Chemical quantities reported by SIC 4953. These facilities would not have opportunities for reducing NPEP Priority Chemicals and the quantities reported would duplicate offsite transfer quantities reported by the generating facilities.

For facilities reporting under SIC Code 7389--Solvent Recovery Services, the chemicals reported to TRI result from solvent recovery or blending (blended solvents are sold to cement kilns to be used as fuel). These materials would be reported by the original generators and there are no opportunities for reducing these NPEP Priority Chemicals at the solvent recovery facilities.

Therefore, the chemicals reported by SIC 7389 facilities are eliminated from the total quantities of NPEP Priority Chemicals.

In summary, NPEP Priority Chemical quantities for SIC Codes 3241, 4953, and 7389 will be removed to eliminate double-counting of these chemicals.

Accounting for Bevill Wastes

RCRA Section 3001(b)(3), often referred to as the Bevill exemption, exempts from RCRA Subtitle C regulation, certain solid waste, including "fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels" and "solid waste from the extraction, beneficiation, and processing of ores and minerals."[16]

A significant quantity of NPEP Priority Chemicals, especially metals, reported to the TRI may be covered by the Bevill exemption, and therefore exempt from RCRA Subtitle C regulation. Although the current measurement methodology is keyed to determining quantities of NPEP Priority Chemicals in "RCRA hazardous wastes," it previously did not identify what portion of the NPEP Priority Chemicals reported to TRI may be Bevill-exempt. This information is not directly or readily discernible from the TRI Form R reports.

For the purposes of the Trends-Analysis, a list of SIC codes potentially affected by the Bevill Amendment was compiled. A list of facilities within these SIC codes that had reported NPEP Priority Chemical quantities and their reported chemicals was developed. Based on discussions with trade associations and EPA staff, the following methodology was created.

For listed facilities in SIC code 2816 and 2819, all of the NPEP Priority Chemical quantities reported by these facilities were removed from the final calculated NPEP Priority Chemical quantities, as they are associated with the bevilled exempt titanium dioxide (TiO2) process:

- DuPont Edge Moor, DE-DED000800284
- Kerr-McGee Pigments, GA-GAD003282803
- Louisiana Pigment, LP, LA-LAD985185149
- Millennium Inorganic Chemicals, Hawkins Point Plant, MD-MDD003093515
- Kerr-McGee Chemical LLC Electrolytic Plant, MS-MSD007025117
- DuPont Delisle Plant, MS-MSD096046792
- DuPont Johnsonville Plant, TN-TND004044491
- U.S. Borax, Inc., CA-CAD000630020
- IMC Chemicals, Inc., CA-CAD048456941

[16] However, it should be noted that even though these materials are exempt from regulation under RCRA Subtitle C, the improper management of these materials can cause harm to human health and the environment.

For SIC 3312, according to the American Iron and Steel Institute (AISI), the NPEP Priority Chemical quantities for at least metals from the following listed facilities are associated with blast furnace and basic oxygen furnace wastes including dust/sludge and slag. Although we believe that the majority of the NPEP Priority Chemical quantities at these facilities are metals (e.g., lead, cadmium, or mercury) that are exempt from RCRA Subtitle C regulation by the Bevill exemption, there also may be other non-metal NPEP Priority Chemical quantities at these facilities that are covered by this exemption. Furthermore it is feasible that these facilities have relatively smaller quantities of the NPEP Priority Chemicals that are not covered by the Bevill exemption. Due to the need to simplify this portion of the NPEP Priority Chemical measurement methodology and resource constraints, we did not make subtle distinctions but rather assumed that, for the purposes of this document, all NPEP Priority Chemical quantities at these facilities were covered by the exemption. As such, the final calculated NPEP Priority Chemical quantities do not include any NPEP Priority Chemicals reported by these facilities:

- Granite City Steel, IL-ILD008873937
- ACME Steel Co. Riverdale Plant, IL-ILD020952362
- Bethlehem Steel Corp. Burns Harbor Div., IN-IND003913423
- Ispat Inland Inc., IN-IND005159199
- USS Gary Works, IN-IND005444062
- LTV Steel, Co., IN-IND005462601
- AK Steel Corp., KY-KYD005013032
- Bethlehem Steel, MD-MDD053945432
- National Steel Corp. Great Lakes Ops., MI-MID004320479
- Wheeling-Pittsburgh Steel Corp. Steubenville North, OH-OHD000810382
- LTV Steel Co., Inc. Cleveland Works, OH-OHD004218673
- AK Steel Corp. OH-OHD004234480
- WCI Steel, Inc., OH-OHD060409521
- Wheeling-Pittsburgh Steel Corp., Mingo Junction, OH-OHD980618177
- Republic Tech. Intl. Lorain Plant, OH-OHR000037713
- Allegheny Ludlum Corp., PA-PAD004335154
- USS Mon Valley Works Edgar Thomson Plant, PA-PAD060682606
- Geneva Steel, L.L.C., UT-UTD009086133
- Weirton Steel Corp., WV-WVD000068908
- Wheeling-Pittsburgh Steel Corp. Steubenville East, WV-WVD004319539

For the mining SIC codes listed below, all of the NPEP Priority Chemical quantities were deleted as the National Mining Association (NMA) noted that essentially 100 percent of the NPEP Priority Chemicals reported by facilities in these SICs were contained in Bevill exempt materials:

1021, 1031, 1041, 1044, 1061, 1099, 1221, 1222, 3331, 3339

In addition, “Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste, generated primarily from the combustion of coal or other fossil fuels, except as provided by Sec. 266.112 of this chapter for facilities that burn or process hazardous waste.” are also RCRA

exempt wastes (40 CFR 261.4(b)(4)). These wastes would pertain to SIC 4911–Electric Services, SIC 4931-Electric and Other Services Combined, and SIC Code 4939-Combination Utilities, Not Elsewhere Classified. Therefore, the NPEP Priority Chemical quantities associated with these SIC have also been removed.

The above approach represents our best estimate at this time for quantifying the portion of the NPEP Priority Chemicals reported to TRI, which may be contained in Bevill-exempt materials and thus are exempt from regulation under RCRA Subtitle C. These quantities may be an over-estimate, as they may include a minimal portion of RCRA-hazardous waste. In any case, it is important to note that even though the NPEP Priority Chemical quantities for these facilities/SIC codes are not included in the calculated NPEP Priority Chemical quantity, there may well be potential opportunities in NPEP Priority Chemical reductions associated with these NPEP Priority Chemical quantities. As such, we encourage these facilities to become partners with EPA to pursue efforts to eliminate or reduce the generation of these quantities of chemicals. Conversely we may have underestimated the quantity of NPEP Priority Chemicals that may be contained in Bevill exempt material as there may be other facilities that fall within SIC code 2816/2819 that produce TiO2 associated wastes or within SIC 3312 that produce blast furnace or basic oxygen furnace associated wastes which likewise are covered by the Bevill exemption. It should be noted that information regarding the Bevill-associated NPEP Priority Chemical quantities that were not included in the total NPEP Priority Chemical quantities is provided in Appendix C.

Limitations of the Measurement Methodology for TRI Data

The measurement methodology is relatively easy to construct and allows for focusing on specific areas of concern. However, it has a number of limitations, which are described in this section along with efforts to address the limitations, where feasible.

Limitations of the measurement method:

- Does not include all NPEP PCs;
- Does not include all facilities generating hazardous waste;
- Does not include water and air releases that may be regulated under RCRA; and
- Relies on the accuracy of TRI data;

Coverage of NPEP NPEP Priority Chemicals

As previously noted, the initial primary objective of the measurement methodology was to measure progress toward the 50 percent reduction of NPEP Priority Chemical quantities in hazardous waste, as compared to the NPEP Priority Chemical quantities in 1991. The methodology, as now refined, addresses all of the NPEP Priority Chemicals for which there is TRI data. However, as previously noted, not all of the 30 chemicals identified by EPA as NPEP Priority Chemicals, are reported to the TRI. Thus, application of the measurement methodology does not allow the evaluation of all NPEP Priority Chemicals using only TRI data. In an effort to address this limitation, BR data is being used to obtain information regarding trends for these NPEP Priority Chemicals not reported to TRI.

B.5.2 Coverage of Facilities Generating Hazardous Waste

Although the TRI has been selected as the data source for the measurement methodology, it does not cover all facilities that generate hazardous waste. This section discusses the potential impacts of this limitation.

Use of EPA ID Number in Facility Selection

In selecting the relevant facilities, EPA assumes that facilities with an EPA ID are likely to generate NPEP Priority Chemicals potentially associated with hazardous wastes, and, thus, the analysis would be limited to those facilities. However, not all facilities that have an EPA ID report to TRI. In addition, the possibility exists that some facilities may continue to report their EPA ID number when they stop generating hazardous wastes or when they drop below hazardous waste thresholds. Because of this possibility, this analysis may overestimate the NPEP Priority Chemical quantities found in hazardous wastes.

Another factor that may lead to an overestimation of NPEP Priority Chemical quantities is that facilities reporting to TRI may report their EPA ID number in all of their Form Rs, even though generation of a particular NPEP Priority Chemical may not be associated with a RCRA activity. For instance, suppose a facility has a RCRA permit and five different streams of TRI-reportable chemicals, one of which is subject to RCRA. The facility may show its EPA ID number on the reporting form for each of these different chemicals, not just on the Form R for the hazardous waste stream. Each of these chemicals will then appear in the analysis as quantities found in hazardous waste, which may lead to overestimating the quantities of chemicals found in hazardous waste.

In addition, because the reporting methods in TRI do not always distinguish between chemical quantities coming from hazardous and non-hazardous wastes, some portion of the NPEP Priority Chemical quantity that has been determined through the methodology to be associated with hazardous wastes, may actually be associated with non-hazardous waste. Therefore, the quantities of chemicals counted due to their association with hazardous waste may be overestimated.

Reporting Industry Sectors

Although the list of reporting industry sectors (i.e., SIC codes) is extensive, there may be a number of facilities producing hazardous waste that are not subject to TRI reporting requirements. In addition, the threshold quantities that determine whether facilities are subject to TRI reporting are based on chemicals used, manufactured, or processed. Consequently, some facilities producing hazardous waste within the SIC codes covered by the TRI may not be required to report to the TRI.

Non-Specificity of Management in RCRA Subtitle C Units

Prior to 1996, there is no way of making a clear distinction between those quantities of chemicals being sent to onsite hazardous waste management units versus non-hazardous units. Beginning with the 1996 TRI reporting year, TRI reporters must specify the quantity of chemicals being "released" to onsite Subtitle C landfills and onsite Class I Underground Injection wells – both

used for the management of RCRA hazardous waste. As such, the methodology likely overestimates the NPEP Priority Chemical quantities – especially prior to 1996. Similarly, there currently is not a direct way to comprehensively determine whether a quantity of a NPEP Priority Chemical that is sent offsite for treatment, disposal, or energy recovery is contained in a hazardous or non-hazardous waste. The methodology was further refined in this trends report to better estimate the quantity of a NPEP Priority Chemical that is regulated as RCRA Subtitle C hazardous waste.

It should be noted that TRI is continuing to modify Form R to address this issue. Future TRI reports may require even further distinction between NPEP Priority Chemical Subtitle C and non-Subtitle C wastes. For example, on the 2002 Form R, the codes used to specify offsite disposal have been updated. M72 (Landfill/Disposal Surface Impoundment) was deleted and replaced by M codes M63 (Surface Impoundment), M64 (Other Landfills) and M65 (RCRA Subtitle C Landfills). Future TRI reports may incorporate other changes to provide even better distinctions to be made between NPEP Priority Chemicals in onsite and offsite RCRA Subtitle C and non-Subtitle C wastes.

Industry Sector NPEP Priority Chemical Quantities

A single facility may report up to six 4-digit SIC codes on the TRI Form R (Section 4.5(a) to Section 4.5(f)). If the facility is a multi-establishment facility, the primary 4-digit SIC code for the entire facility is recorded first, and then the SIC code of each associated establishment is recorded. The measurement methodology allocates all NPEP Priority Chemical quantities, in any given reporting year, to the facility's primary SIC code only. Thus, unless a facility only reported its primary SIC code, the method allows for an overestimation of NPEP Priority Chemical quantities to the primary SIC code and effectively assigns a zero quantity to all other SIC codes. In addition, facilities may change their primary SIC code from year to year. Thus, when conducting the trends analysis, it could appear that NPEP Priority Chemical quantities are being reduced or increased for certain industry sectors, when actual quantities are not changing but only being reported differently.

Coverage of Water and Air Releases

Although EPA assumed, for the purposes of this report, that TRI reported fugitive and point source releases to air and discharges to surface water are not necessarily associated with hazardous waste, some of these releases may, in fact, be regulated under RCRA. For example, some fugitive air emissions may be RCRA-regulated if they occur during treatment of hazardous waste. However, information reported under Sections 5.1 and 5.2 of Form R does not provide any indication of the extent to which these releases may be RCRA-regulated releases. We believe that the RCRA-regulated portion of these releases is relatively small in comparison to other releases and waste management quantities and, therefore, it is reasonable to exclude these quantities of NPEP Priority Chemicals.

Changes in TRI Reporting Requirements

The TRI has been selected as the data source for the NPEP Priority Chemical measurement methodology, but TRI reporting requirements change over time. In this section, changes to TRI reporting and their potential impact on the methodology are described.

Reporting Thresholds for TRI Chemicals

Some NPEP Priority Chemicals are sufficiently potent or accumulate to such a degree that the current thresholds in TRI may not be appropriate. Consequently, EPA modified the reporting thresholds for certain chemicals/chemical categories for reporting year 2000. The NPEP Priority Chemicals for which the threshold was changed include heptachlor, hexachlorobenzene, mercury/mercury compounds, methoxychlor, pendimethalin, trifluralin, and polycyclic aromatic compounds (PACs). For some of these chemicals, the threshold was set at 100 pounds, and for others, at 10 pounds. In addition, starting with reporting year 2001, the reporting thresholds for lead/lead compounds, except lead contained in stainless steel, brass or bronze alloys, have been lowered to 100 pounds. Over time, certain TRI facilities may drop below the reporting thresholds and not report in a given year. Because the facility would not report in the year it is below the reporting threshold, the method effectively assumes that the generation of chemicals in waste from the facility has dropped to zero. While this might overstate the NPEP Priority Chemical reduction progress, it is counterbalanced by facilities that newly report because they exceed the threshold. In addition, the chemical quantities associated with these facilities are likely to be small compared to the reporters remaining in the system. Overall, these changes will likely result in an increased reporting of NPEP Priority Chemicals already in the TRI. As described above, for those NPEP Priority Chemicals for which a threshold has changed, the use of a "core" group of facilities has been used for the GPRA-Analysis in order to most accurately evaluate the progress towards the GPRA goal. In other words, only parties that have been included in the GPRA-Analysis continue to be included. It should be noted that in addition, newly reporting parties whose reporting quantity is over the original threshold of 10,000 pounds are also included, as it is assumed that this party would have reported under the original threshold.

Chemical Expansion

Of the 30 chemicals identified by EPA as NPEP Priority Chemicals, only 17 (cadmium, lead, and mercury along with each of their compounds are addressed as 3 chemicals rather than as 6 separate chemicals), have been reported to the TRI since 1991. Three additional NPEP Priority Chemicals began to be reported to the TRI in 1995; and three more in 2000. The three chemicals (benzo(g,h,i)perylene, dioxin and dioxin-like compounds, and pentachlorobenzene) that were required to be reported to TRI, beginning in 2000, also were subject to the lower TRI reporting threshold discussed above. However, the reporting threshold for dioxin and dioxin-like compounds was established to be 0.1 grams. EPA may add other chemicals to TRI in the future that will have an impact on how NPEP Priority Chemicals are presented in the annual trends reports. The addition of new chemicals to the TRI is advantageous as far as covering more of the NPEP Priority Chemicals, but also creates issues about what year to use as a baseline for the new chemicals introduced. For this trends report, only the original 17 chemicals are included in the

GPRA-Analysis using 1991 as the baseline year. For the Trends-Analysis, all NPEP Priority Chemicals reported to TRI are included using the base year of 1998.

Industrial Sector Expansion

Over time, the facilities required to report to the TRI change due to modifications to the list of reporting industry sectors (i.e., SIC codes). This change in reporting requirements is particularly significant because of the expansion of the TRI reporting sectors in 1998. If additional expansions of industry sectors occur, EPA will assess whether the expansion has a significant effect on reported NPEP Priority Chemical quantities. If the impact of the change appears to be significant, EPA will evaluate if, and how, to incorporate the new TRI reporters into the measurement methodology and the subsequent trends analyses. For the Trends-Analysis in this report, facilities in the "new" industry sectors that began reporting to TRI for the 1998-reporting year are considered in conducting the methodology.

Accuracy of TRI Data

Another limitation of basing the measurement methodology on TRI data is that errors in the data could lead to incorrect interpretation of trends. Therefore, it is important to ensure that the data are accurate. This section discusses the quality assurance (QA) efforts made by the EPA Office of Environmental Information that collects TRI data (i.e., the TRI Program), as well as QA activities conducted as part of the trends analysis.

QA Activities Conducted by the TRI Program

The TRI Program takes several steps to ensure high-quality data. These steps include:

- EPA provides extensive compliance assistance such as general or industry-specific or chemical-specific guidance documents, industry training workshops for both the manufacturing industry and the new industry sectors and updated Reporting Forms and Instructions with examples from data quality technical surveys.
- Beginning with reporting year 2001, EPA began distributing, as a part of its Reporting Forms and Instructions package, an interactive, intelligent, and user-friendly software that guides facilities through the entire TRI reporting experience. The *TRI-ME* (Toxics Release Inventory – Made Easy) software walks the user through compliance determinations, guidance searches, forms completion, including validation of the data, and submission of the completed forms to EPA by one of three methods: paper, diskette with paper certification letter, and electronically via the Internet with electronic signature.
- EPA's Data Entry Process is virtually (99.9 percent) error free. A key component of this process is double key entry.
- Once a facility's data is entered into the TRIS database, a Facility Data Profile (FDP) is generated in a PDF file format and is placed on a secure, password protected website for the facilities to retrieve their data. The TRIS database automatically checks for errors and notes those on the FDP. Facilities can make revisions to their data as outlined in the TRI Reporting Forms and Instructions.
- Independent of the "FDP process," EPA has a process for facilities to revise or withdraw their chemical reports if they discover they have made an error in reporting. For the 2001

reporting year, EPA processed approximately 350 requests from facilities to withdraw reported data from the TRI database and about 10,000 revisions to data.

- EPA sends each state a list of all the facilities that submitted a TRI report to EPA and all the chemicals that they reported so that the states can check this against the TRI reports they directly receive.
- EPA sends each state a list of the 100 facilities with the largest releases in that state. EPA asks the state to make sure that there are no facilities included or excluded that should not be. EPA follows up with telephone calls to the states.
- This year, because of concerns over the quality of newly-reported lead and lead compounds data under lower reporting threshold, EPA calls facilities that may have an error in reporting, for example, those facilities that reported very large increases or decreases in their releases from one year to the next; facilities with very large quantities of releases and total production-related waste; facilities that reported wrong SIC codes; facilities that reported wrong RCRA ID in their transfers; facilities that reported wrong state code in their transfers; facilities that reported wrong quantities for waste management activities (release, treatment, energy recovery and recycling); and facilities that reported range reporting for PBT chemicals. EPA called over 850 facilities this year that met that criteria. As a result of these calls, approximately 377 facilities revised/withdrew their reported release and other waste management data for PBT and non-PBT chemicals.

OSW QA Activities Associated with the Trends Analysis

As part of developing the database for the trends analysis, OSW conducts QA activities to supplement the activities undertaken by the TRI Program. These QA activities include:

- Reviewing the NPEP Priority Chemical database to identify facilities that experienced significant changes in the quantity of NPEP Priority Chemicals reported for the years 1999 to 2000 and 2000 to 2001. For purposes of this analysis, a "significant change" means: (1) an increase of 100 percent or more in the annual quantity of chemical reported or (2) a decrease of 50 percent or more in the annual quantity of chemical reported.
- From these identified significant changes, further identifying those facilities where this change represented at least 20 percent of the total quantity of that NPEP Priority Chemical for reporting year 2000 or 2001.
- Obtaining and reviewing information on these facilities from the TRI Program (i.e., QA documentation developed by the TRI program) or by contacting the EPA Regions, States, or individual facilities to confirm the accuracy of the facilities' information in the TRI database.
- Revising the NPEP Priority Chemical database, as appropriate, based on the results of the above QA activities.

B.4.2 BR Data Methodology

The measurement methodology for the NPEP Priority Chemical Trends Report has been based solely on TRI data. However, the TRI data is not available for the NPEP Priority Chemicals listed in Exhibit B-5.

Exhibit B-5. NPEP Priority Chemicals

NPEP Priority Chemical Names and CAS Numbers	
PCs NOT REPORTED TO TRI	
Acenaphthene (83-32-9)	Fluorene (86-73-7)
Acenaphthylene (208-96-8)	Heptachlor epoxide (1024-57-3)
4-Bromophenyl phenyl ether (101-55-3)	Pyrene (129-00-0)
Endosulfan, beta- (33213-65-9) Endosulfan, alpha (959-98-8)	1,2,4,5-Tetrachlorobenzene (95-94-3)

Therefore, a methodology was developed to use Hazardous Waste Report data (Biennial Report (BR) data) to evaluate trends for these chemicals over time. It is anticipated that the use of BR data will provide additional insights into the waste streams containing NPEP Priority Chemicals that present potential chemical reduction options. EPA developed an initial approach to identify and extract the necessary BR data. This approach consists of the steps discussed below. EPA anticipates that this approach will be further refined in the future to focus on providing information that will present the most viable possibilities for reducing NPEP Priority Chemicals, such as eliminating sources or industry sectors that do not present such opportunities, as the TRI methodology was refined in this trends report.

The BR data presents various differences from TRI regarding compilation of the data that need to be taken into consideration.

SIC/NAICS Codes: Data included in the BR analysis incorporates information from all industry sectors that report to BR. It should be noted that BR data includes North American Industry Classification System (NAICS codes), rather than SIC codes. In addition, the universe of industry sectors that report to BR is larger than those that are required to report to TRI. By including all NAICS codes in the BR methodology, information regarding additional industry sectors that are producing wastes containing NPEP Priority Chemicals is made available.

Thresholds: The thresholds for reporting of data to BR are different than those that require reporting to TRI. Therefore, the universe of reporters is potentially different.

Quantities Reported: The BR collects information on waste streams, unlike TRI that collects information on specific chemicals. The BR program requires all large quantity generators (LQG) and treatment, storage and disposal (TSD) facilities to report hazardous waste generation information based on waste streams, including waste codes describing the waste stream and total quantities of this waste stream. TRI requires reporting on the quantity of the hazardous chemical specifically. Therefore, the quantities reported to BR are most likely larger than those reported to TRI and represent the total waste stream containing the chemical, not the amount of chemical itself.

Step 1: Identify Relevant BR Data Regarding Waste Steams Containing NPEP Priority Chemicals

Some waste codes apply to specific chemicals and others to waste types that may contain multiple chemicals, for example, the F001 definition is as follows:

> The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spend solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

If a facility reports that its waste stream is associated with waste code F001 it could include the NPEP Priority Chemicals 1,2,4-trichlorobenzene and naphthalene. In addition, it possibly contains the NPEP Priority Chemical metals lead, mercury, or cadmium. Therefore, one code could pertain to multiple NPEP Priority Chemical chemicals and the quantity of each chemical in the waste stream cannot be discerned from the BR data. In addition, a facility can report multiple codes for one waste stream, and the quantity of each code in the waste stream is not broken down.

For the purpose of this analysis a crosswalk table has been prepared to list the waste codes that can be associated with the NPEP Priority Chemicals that are not reported to TRI. This list of waste codes is being created to assist in the compilation of the total pounds reported by facilities that may contain that NPEP Priority Chemical. It should be noted, however, that the specific quantities of each chemical contained in the wastes will not always be discernable from the BR data. The total quantity that will be calculated will represent the worst-case scenario in which this chemical makes up 100 percent of the quantity reported. The BR data does not allow for an exact determination of what percentage of the chemical is contained in the waste stream.

Based on the EPA Hazardous Waste Code Definitions, the Basis for Listing Hazardous Waste (Appendix VII to Part 261), and CFR 268.40 (Land Disposal Regulations) the waste codes below were used to calculate NPEP Priority Chemical quantities for those NPEP Priority Chemicals not reported to TRI. It should be noted that although many of the NPEP Priority Chemicals are associated with F039, this waste code has not been included because F039 is defined as a leachate and therefore does not present viable opportunities in reducing NPEP Priority Chemicals.

1,2,4,5-Tetrachlorobenzene

U207 is 1,2,4,5-tetrachlorobenzene.
The basis for listing **F024** includes tetrachlorobenzene.
The basis for listing **F025** includes tetrachlorobenzene.
The basis for listing **K085** includes tetrachlorobenzene.
The basis for listing **K149** includes 1,2,4,5-tetrachlorobenzene.
The basis for listing **K150** includes 1,2,4,5-tetrachlorobenzene.
The basis for listing **K151** includes 1,2,4,5-tetrachlorobenzene.

The definition of **K042** is "Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T."

4-Bromophenyl phenyl ether
U030 represents 4-Bromophenyl phenyl ether.
Not included as a basis for any listing.

Acenaphthene
Not included in the definition of any waste codes or as a basis for any listing.
Based on CFR 268.40, wastes which may contain this chemical are associated with waste codes **F032**, **F034**, **F037**, **K035**, **K051** and **K088**.

Acenaphthylene
Not included in the definition of any waste codes or as a basis for any listing.
Based on CFR 268.40, wastes which may contain this chemical are associated with waste code **K087**.

Endosulfan, beta-/Endosulfan, alpha
P050 is endosulfan.
Not included as a basis for any listing.

Fluorene
U005 is 2-Acetylaminofluorene
Fluorene is not included in the definition of any waste codes or as a basis for any listing.

Heptachlor epoxide
D031 represents heptachlor and its epoxide.
P059 represents heptachlor.
The basis for listing **K097** includes heptachlor.

Pyrene
Not included specifically in any definition or as a basis for any listing.
Based on CFR 268.40, wastes which may contain this chemical are associated with waste codes **F032**, **F034**, **F037**, **F038**, **K001**, **K035**, **K048**, **K049**, **K051**, **K088**, **K169**, **K170**, **K171** and **U051**.

Based on the EPA Hazardous Waste Code Definitions, the Basis for Listing Hazardous Waste (Appendix VII to Part 261), and CFR 268.40, (Land Disposal Regulations) the waste codes below will be used to calculate NPEP Priority Chemical quantities for those NPEP Priority Chemicals that are reported to TRI. As stated above, although many of the NPEP Priority Chemicals are associated with F039, this waste code has not been included because F039 is defined as a leachate and therefore does not present viable opportunities in reducing NPEP Priority Chemicals.

1,2,4-Trichlorobenzene
The basis for listing **F024** includes 1,2,4-trichlorobenzene.
The basis for listing **F025** includes 1,2,4-trichlorobenzene.

The basis for listing **K085** includes trichlorobenzenes.
The basis for listing **F150** includes 1,2,4-trichlorobenzene.
Not included in the definition of any waste codes**.**

2,4,5-Trichlorophenol
D041 represents 2,4,5-trichlorophenol**.**
K001 represents trichlorophenols.

Based on CFR 268.40, wastes which may contain this chemical are associated with waste codes **F020**, **F021**, **F022**, **F023**, and **F026**.

Benzo(g,h,i)perylene
Not included as a basis for any listing.
Based on CFR 268.40, wastes which may contain this chemical are associated with waste codes **K088**, **K169** and **K170**.

Cadmium
D006 represents cadmium.
The basis for listing **F006** includes the presence of cadmium, hexavalent chromium, nickel, and cyanide.
The basis for listing **K061** includes chromium, lead, and cadmium.
The basis for listing **K064** includes lead and cadmium.
The basis for listing **K069** includes chromium, lead, and cadmium.
The basis for listing **K100** includes chromium, lead, and cadmium.

Dibenzofuran
Dioxins/Furans
Pentachlorophenol
D037 represents pentachlorophenol.
U124 represents furans.
The basis for listing **F020** includes tetra- and pentachlorodibenzo-p- dioxins; tetra and pentachlorodi- benzofurans; tri- and tetrachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.
The basis for listing **F021** includes penta- and hexachlorodibenzo-p- dioxins; penta- and hexachlorodibenzofurans; pentachlorophenol and its derivatives.
The basis for listing **F022** includes tetra-, penta-, and hexachlorodibenzo- p-dioxins; tetra-, penta-and hexachlorodibenzofurans.
The basis for listing **F023** includes tetra-, and pentachlorodibenzo-p- dioxins; tetra- and pentachlorodibenzofurans; tri- and tetrachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.
The basis for listing **F026** includes tetra-, penta-, and hexachlorodibenzo- p-dioxins; tetra-, penta-, and hexachlorodibenzofurans.
The basis for listing **F027** includes tetra-, penta-, and hexachlorodibenzo- p- dioxins; tetra-, penta-, and hexachlorodibenzofurans; tri-, tetra- , and pentachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.
The basis for listing **F028** includes tetra-, penta-, and hexachlorodibenzo- p- dioxins; tetra-, penta-, and hexachlorodibenzofurans; tri-, tetra- , and pentachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.

The basis for listing **F032** includes benz(a)anthracene, benzo(a)pyrene, dibenz(a,h)-anthracene, indeno(1,2,3- cd)pyrene, pentachlorophenol, arsenic, chromium, tetra-, penta-, hexa-, heptachlorodibenzo-p-dioxins, tetra-, penta-, hexa-, heptachlorodibenzofurans.
The basis for listing **K174** includes 1,2,3,4,6,7,8-Heptachlorodibenzo-p- dioxin (1,2,3,4,6,7,8-HpCDD), 1,2,3,4,6,7,8-heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF), 1,2,3,4,7,8,9-heptachlorodibenzofuran (1,2,3,6,7,8,9-HpCDF), HxCDDs (all hexachlorodibenzo-p-dioxins), HxCDFs (All hexachlorodibenzofurans), PeCDDs (all pentachlorodibenzo-p-dioxins), OCDD (1,2,3,4,6,7,8,9-octachlorodibenzo-p-dioxin, OCDF (1,2,3,4,6,7,8,9-octachlorodibenzofuran), PeCDFs (all pentachlorodibenzofurans), TCDDs (all tetrachlorodi-benzo-p-dioxins), TCDFs (all tetrachlorodibenzofurans).
The basis for listing **K001** includes pentachlorophenol.

Hexachlorobenzene
D032 represents hexachlorobenzene.
U127 represents hexachlorobenzene.
The basis for listing **F024** includes hexachlorobenzene.
The basis for listing **F025** includes hexachlorobenzene.
The basis for listing **K016** includes hexachlorobenzene.
The basis for listing **K018** includes hexachlorobenzene.
The basis for listing **K030** includes hexachlorobenzene.
The basis for listing **K042** includes hexachlorobenzene.
The basis for listing **K085** includes hexachlorobenzene.
The basis for listing **K149** includes hexachlorobenzene.
The basis for listing **K150** includes hexachlorobenzene.
The basis for listing **K151** includes hexachlorobenzene.

Hexachlorobutadiene
D033 represents hexachlorobutadiene.
U128 represents hexachlorobutadiene.
The basis for listing **K016** includes hexachlorobutadiene.
The basis for listing **K018** includes hexachlorobutadiene.
The basis for listing **K030** includes hexachlorobutadiene.

Hexachlorocyclohexane (lindane)
D013 represents hexachlorocyclohexane (lindane).
U129 represents hexachlorocyclohexane (lindane)
The basis for listing **F024** includes hexachlorocyclohexane (lindane).

Hexachloroethane
D034 represents hexachloroethane.
U131 represents hexachloroethane.
The basis for listing **F024** includes hexachloroethane.
The basis for listing **F025** includes hexachloroethane.
The basis for listing **K016** includes hexachloroethane.
The basis for listing **K030** includes hexachloroethane.

Lead
D008 represents lead.
The basis for listing **K046** is lead.
The basis for listing **K061** includes chromium, lead, and cadmium.
The basis for listing **K069** includes chromium, lead, and cadmium.
[It should be noted that the four waste codes listed above are the ones that an EPA Headquarters study concluded represented the waste streams most likely to contain lead. For consistency, only these four codes are being used in this methodology.]

Mercury
D009 represents mercury.
U151 represents mercury.
The basis for listing **K071** is mercury.
The basis for listing **K106** is mercury.
The basis for listing **K175** is mercury.

Methoxychlor
D014 represents methoxychlor.
U247 represents methoxychlor.
Not included as a basis for any listing.

Naphthalene
U165 represents naphthalene.
The basis for listing **F024** includes naphthalene.
The basis for listing **F025** includes naphthalene.
The basis for listing **F034** includes naphthalene.
The basis for listing **K001** includes naphthalene.
The basis for listing **K035** includes naphthalene.
The basis for listing **K087** includes naphthalene.
The basis for listing **K145** includes naphthalene.
Based on CFR 268.40, wastes which may contain this chemical are associated with waste codes **K048, K049, K051, K052, and K060.**

Pentachlorobenzene
U183 represents pentachlorobenzene.
The basis for listing **F024** includes pentachlorobenzene.
The basis for listing **F025** includes pentachlorobenzene.
The basis for listing **K085** includes pentachlorobenzene.
The basis for listing **K149** includes pentachlorobenzene.
The basis for listing **K150** includes pentachlorobenzene.
The basis for listing **K151** includes pentachlorobenzene.

Pentachloronitrobenzene (Quintozene)
U185 represents pentachloronitrobenzene.
Not included as a basis for any listing.
Phenanthrene

Not included as a basis for any listing. Based on CFR 268.40, waste codes which may contain this chemical are **F032, F034, F037, F038, K001, K015, K019, K035, K048, K049, K051, K052, K087, K088, K169, K170, K171 and U051**.

Pendimethalin
Not included specifically in any definition or as a basis for any listing.
This chemical was not listed in CFR 268.40.

Trifluralin
Not included specifically in any definition or as a basis for any listing.
This chemical was not listed in CFR 268.40.

Anthracene-
Not included specifically in any definition or as a basis for any listing.
Based on CFR 268.40, wastes which may contain this chemical are associated with waste codes **F032**, **F034**, **F037**, **K015**, **K035**, **K049**, **K051** and **K088**.

PAH Group- U018, U022, U063, U064, U094, F032, F034, F037, F038, K001, K035, K048, K049, K050, K051, K052, K060, K141, K142, K143, K144, K145, K147, K148, K170 (based on the breakdown below):

- Benzo(a)anthracene U018, F032, F034, K001, K141, K142, K143, K144, K145, K147, K148
- Benzo(b)fluoranthene--K001, K141, K142, K143, K144, K147, K148
- Benzo(j)fluoranthene--None
- Benzo(j,k)fluorene--None
- Benzo(k)fluoranthene--F034, K141, K142, K143, K144, K147, K148, K170
- Benzo(rst)pentaphene--U064
- Benzo(a)phenanthrene--None
- Benzo(a)pyrene--U022, F032, F034, F037, F038, K001, K035, K048, K049, K050, K051, K052, K060, K141, K142, K144, K145, K147, K148, K170
- Dibenz(a,h)acridine--None
- Dibenz(a,j)acridine--None
- Dibenzo(a,h)anthracene--U063
- Dibenzo(c,g)carbazole--None
- Dibenzo(a,e)fluoranthene--None
- Dibenzo(a,e)pyrene--None
- Dibenzo(a,h)pyrene--None
- Dibenzo(a,l)pyrene--None
- Dimethylbenz(a)anthracene--K170, U094
- Indeno[1,2,3-cd]pyrene--None
- Methylcholanthrene--K170
- Methylchrysene--None
- Nitropyrene—None

The two above lists can be compiled as follows:

Name	RCRA Waste Code
1,2,4,5-Tetrachlorobenzene	U207, F024, F025, K085, K149, K150, K151, K042
4-Bromophenyl phenyl ether	U030
Acenaphthene	F032, F034, F037, K035, K051, K088
Acenaphthylene	K087
Endosulfan, beta-/Endosulfan, alpha	P050
Fluorene	U005
Heptachlor epoxide	D031, P059, K097
Pyrene	F032, F034, F037, F038, K001, K035, K048, K049, K051, K088, K169, K170, K171, U051
1,2,4-Trichlorobenzene	F024, F025, K085, F150
2,4,5-Trichlorophenol	D041, K001, F020, F021, F022, F023, F026
Benzo(g,h,i)perylene	K088, K169, K170
Cadmium	D006, F006, K061, K064, K069, K100
Dibenzofuran, Dioxins/Furans , Pentachlorophenol	D037, U124, F020, F021, F022, F023, F026, F027, F028, F032, K174, K001
Hexachlorobenzene	D032, U127, F024, F025, K016, K018, K030, K042, K085, K149, K150, K151
Hexachlorobutadiene	D033, U128, K016, K018, K030
Hexachlorocyclohexane (lindane)	D013, U129, F024
Hexachloroethane	D034, U131, F024, F025, K016, K030,
Lead	D008, K046, K061, K069
Mercury	D009, U151, K071, K106, K175
Methoxychlor	D014, U247
Naphthalene	U165, F024, F025, F034, K001, K035, K048, K049, K051, K052, K060, K087, K145
Pentachlorobenzene	U183, F024, F025, K085, K149, K150, K151
Pentachloronitrobenzene (Quintozene)	U185
Phenanthrene	F032, F034, F037, F038, K001, K015, K019, K035, K048, K049, K051, K052, K087, K088, K169, K170, K171, U051
Pendimethalin	None
Trifluralin	None
Anthracene	F032, F034, F037, K015, K035, K049, K051, K088.
PAH Group	U018, U022, U063, U064, U094, F032, F034, F037, F038, K001, K035, K048, K049, K050, K051, K052, K060, K141, K142, K143, K144, K145, K147, K148, K170

Step 2: Calculate Quantity of Waste Streams Containing the NPEP Priority Chemicals

Data was compiled to pertaining to facilities that reported that their waste streams contained at least one of the waste codes that have been associated with that chemical. For example, for the chemical "acenaphthene" information was compiled for all facilities that listed waste codes F032, F034, F037, K035, K051, or K088 in their BR data. Since the ultimate goal of the trends analysis is to minimize the use and disposal of the NPEP Priority Chemicals, the quantity of waste was taken from the waste "generated column" of the BR data so that it will indicate whether the generation of the chemical is going up or down.

Accounting for Double-Counting

If multiple waste codes of concern (as listed above) were reported for a particular waste stream then the quantity was divided between these waste codes. This eliminates double counting. In other words, if the waste generated by the same facility was reported to contain two or more different waste codes which both apply to that waste stream, the total quantity was divided evenly among these waste codes. For example, for acenaphthene, if a facility reported that its waste stream included F032 and K051 the quantity would be split between these two waste codes. Likewise, if two waste codes were listed that apply to two different chemicals the quantity was split evenly among the two waste codes.

Accounting for Waste Codes that Represent More than One Chemical

Some of the waste codes are associated with more than one chemical. The waste codes K035, K051, K088, F032, F034, and F037 are associated with both acenaphthene and pyrene. Waste code F032 is also associated with pentachlorophenol, phenanthrene, and anthracene. For the purposes of this analysis, any wastes associated with these codes has been evenly split between these two or three chemicals, respectively. For example, if a facility reported 1,000 pounds of a waste associated with K035, 500 pounds has been associated with acenaphthene and 500 pounds has been associated with pyrene.

Compilations were then made of total quantities of waste reported by each facility that were associated by the above method with a particular NPEP Priority Chemical. Finally, to be consistent with how TRI data is reported, quantities were then converted from tons to pounds using a factor of 2,000 pounds per ton.

Step 3: Analyze Data Trends

Facilities are required to report BR data every other year. For the purpose of the Trends-Analysis, BR data for the NPEP Priority Chemicals listed above were compiled for 1997, 1999, and 2001. The changes in this data overtime were calculated using the same mathematical approach as used for changes to the TRI data from year to year. Data was analyzed on a national, regional, state, and industry sector basis. It should be noted that NAICS codes were used to represent industry sectors, as these codes are required to be reported by facilities to EPA in Biennial Reports.